

Application Serial No.: 10/085,059
Amendment filed on June 30, 2003
Reply to Office Action dated March 28, 2003

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Currently Amended) ~~An electric~~ A split nut opening/closing device in a mold clamping apparatus in which a fixed platen for holding a fixed mold and a movable platen for holding a movable mold are provided, and a tip-end threaded portion of a plurality of tie bar bars, one end of which is fixed to either one of said platens and the other end of which is projected by penetrating the other platen, is engaged with a split nut provided on the other platen to connect said fixed platen to said movable platen via said tie bars, by which a mold clamping force is generated between said platens in order to clamp said fixed and movable platens by giving tension to said tie ~~bar~~ bars, wherein a each pair of left half piece and right half piece of said split nut are slidably supported so as to hold said tie ~~bar~~ bars therebetween, and said left half piece and right half piece of said two sets of split nuts are brought into contact with and separated from each other at the same time by common driving means so as to hold the tie bar two connecting rods penetrate two sets of the pairs of left half piece and right half piece provided respectively on said tie bars, one end of the connecting rod is fixed to one half piece and the other half piece is slidably supported, the slidably supported half piece and the one half piece are link connected so as to be brought into contact with and separated from each other, and driving means is provided wherein the movement of the one half piece is transmitted to the other half piece via a link mechanism, and the other half piece

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is brought into contact with and separated from said one half piece in connection with said one half piece.

2. (Canceled)

3. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to claim 1 ~~or 2~~, wherein a guide box is provided in positions of two tie bars on the other platen; said guide box slidably support said paired left half piece and right half piece of the ~~left and right split nuts~~ two sets so as to hold said tie bar; said guide box is provided with a link plate rotatably supported via a support pin; a pin engaging with an elongated hole formed at both ends of said link plate is provided on each of said left half piece and right half piece; and said left half piece and right half piece are link connected in a restrained manner so as to move symmetrically with respect to said support pin.

4. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to ~~any one of claims 1 to 3~~ claim 1, wherein ~~two connecting rods penetrate said two sets of left half piece and right half piece; one end of said connecting rod is fixed to one half piece, and the other half piece is slidably supported;~~ a geared motor with brake is mounted on a plate fixed to said connecting rod; and the left half piece and right half piece of said one split nut are brought closer to and separated from each other via a reciprocating ~~mechanism~~ device provided on an output shaft of said geared motor with brake.

5. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to claim 4, wherein the left half piece and right half piece of said one split nut are brought closer to and separated from each other by a the reciprocating device consisting of a ball shaft connected to the output shaft of said geared motor via a

coupling and a ball nut which engages with said ball shaft and is connected to the right half piece of said one split nut.

6. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to ~~any one of claims 3 to 5~~ claim 3, wherein said guide box is made up of attachment portions attached to a side portion and a front portion of said platen, two bottom plates for supporting the half pieces of said split nut, and a groove portion provided between said bottom plates.


7. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to claim 4, wherein a rotating crank mechanism is used in place of said reciprocating device.

8. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to claim 7, wherein the left half piece and right half piece of said one split nut are brought closer to and separated from each other by a driving device comprising a geared motor with brake whose output shaft is installed to a bracket fixed to said connecting rod so as to be perpendicular to said connecting rod; a crank arm which is fixed to the output shaft of said geared motor with brake and has a pin at the tip end; a joint member which is installed to the right half piece of one split nut via an adapter member and is given an initial compressive force by spring means; and a connecting link one end of which is rotatably connected to the tip-end pin of said crank arm and the other end of which is rotatably connected to said joint member via a pin.

9. (Currently Amended) The ~~electric~~ split nut opening/closing device in a mold clamping apparatus according to claim 8, wherein the tip-end pin of said crank arm is

supported at both ends, and said connecting link has a curved shape so as to avoid the interference with said crank arm.

10. (New) A split nut opening/closing device for a mold clamping apparatus, the mold clamping apparatus including a fixed platen, a movable platen, and a plurality of tie-bars each having a first end fixed to either one of said platens and a second end that penetrates the other platen, where the second end has a tip-end threaded portion, said split nut opening/closing device comprising:

 a first split nut adapted to be provided on the other platen to connect the fixed platen to the movable platen via one tie bar of the tie bars by engaging the tip-end threaded portion thereof, said first split nut including a first half piece and a second half piece that are slidably supported on the other platen;


a first link mechanism connecting said first half piece of said first split nut to said second half piece of said first split nut;

a second split nut adapted to be provided on the other platen to connect the fixed platen to the movable platen via another tie bar of the tie bars by engaging the tip-end threaded portion thereof, said second split nut including a first half piece and a second half piece that are slidably supported on the other platen;

a second link mechanism connecting said first half piece of said second split nut to said second half piece of said second split nut;

a connecting rod is fixed to said first half piece of said first split nut and said first half piece of said second split nut, said connecting rod being slidably connected to said second half piece of said first split nut and said second half piece of said second split nut,

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 a driving device configured to drive one of said first half piece and said second half piece of said first split nut, wherein both of said first half piece and said second half piece of said first split nut are moved via said first link mechanism, wherein said first half piece of said second split ring is moved via said connecting rod, and wherein both of said first half piece and said second half piece of said second split nut are moved via said second link mechanism.
